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ART UNIT 2662 Examiner: David E. ODLAND	United States Patent Office – Facsimile Centre	Alexandria, VA	(703) 872-9306

Re: Serial No. 09/349,087
Inventor(s): Kim B. ROBERTS
Title: Mapping Arbitrary Signals into SONET

Reply Brief in response to Examiner's Reply mailed August 23, 2004 attached..

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PTO/SB/21 (08-03)
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/349,087
Filing Date	07/08/1999
First Named Inventor	Kim B. ROBERTS
Art Unit	2662
Examiner Name	David E. ODLAND
Attorney Docket Number	9-13528-211US

Total Number of Pages in This Submission: 25

ENCLOSURES *(Check all that apply)*

- [✔] Fee Transmittal Form
- [ ] Fee Attached
- [ ] Amendment/Reply
- [ ] After Final
- [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
- [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
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- [ ] CD, Number of CD(s) _____
- [ ] After Allowance communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [✔] Appeal Communication to Group **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
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Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Kent Daniels Reg. No. 44,206
Signature	K. Daniels
Date	October 25, 2004

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PTO/SB/17 (10-04v2)
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FEE TRANSMITTAL for FY 2005

Effective 10/01/2004. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 340

Complete if Known	
Application Number	09/349,087
Filing Date	07/08/1999
First Named Inventor	Kim B. ROBERTS
Examiner Name	David D. ODLAND
Art Unit	2662
Attorney Docket No.	9-13528-211US

METHOD OF PAYMENT *(check all that apply)*

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

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Deposit Account Number: 19-5113

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	790	2001	395	Utility filing fee	
1002	350	2002	175	Design filing fee	
1003	550	2003	275	Plant filing fee	
1004	790	2004	395	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

		Extra Claims		Fee from below	Fee Paid
Total Claims		-20** =		X	=
Independent Claims		- 3** =		X	=
Multiple Dependent					=

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	88	2201	44	Independent claims in excess of 3
1203	300	2203	150	Multiple dependent claim, if not paid
1204	88	2204	44	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	430	2252	215	Extension for reply within second month	
1253	980	2253	490	Extension for reply within third month	
1254	1,530	2254	765	Extension for reply within fourth month	
1255	2,080	2255	1,040	Extension for reply within fifth month	
1401	340	2401	170	Notice of Appeal	
1402	340	2402	170	Filing a brief in support of an appeal	340
1403	300	2403	150	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,370	2453	685	Petition to revive - unintentional	
1501	1,370	2501	685	Utility issue fee (or reissue)	
1502	490	2502	245	Design issue fee	
1503	660	2503	330	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 340

SUBMITTED BY

(Complete *(if applicable)*)

Name (Print/Type)	Kent Daniels	Registration No. (Attorney/Agent)	44,206	Telephone	613-780-8673
Signature				Date	October 25, 2004

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :
Kim B. Roberts

Serial No: 09/349,087

Filed: July 8, 1999

Group Art Unit: 2662

Examiner: ODLAND, David E.

For: Mapping Arbitrary Signals into SONET

Assistant Commissioner for Patents
Alexandria, VA 22313-1450

MAIL STOP APPEAL BRIEF -PATENTS

Sir:

APPELLANT'S REPLY BRIEF UNDER 37 C.F.R. § 1.193(b)

Pursuant to 37 C.F.R. § 1.191, the Applicant submitted a Notice of Appeal from the Examiner to the Board of Patent Appeals and Interferences on April 29, 2004. Specifically, the Applicant takes appeal from the Examiner's rejection of claims 1-10, 21-24 and 26-28 under 35 U.S.C. § 103(a). The Notice of Appeal was filed in response to the Examiner's Final Action (paper No. 13) mailed February 4, 2004 and Advisory Action (paper No. 12) mailed April 12, 2004.

Applicant's Appeal Brief under 37 C.F.R. § 1.192 was filed on August 2, 2004. The Examiner's Answer was mailed August 23, 2004.

Pursuant to 37 C.F.R. § 1.193(b), the Applicant now submits the following Reply Brief.

For ease of reference, this Reply Brief is organized into sections which follow the Examiner's Answer mailed August 23, 2004.

APPEAL BRIEF UNDER 37 C.F.R. § 1.192
Serial No. 09/349,087

1) **Real Party in Interest**

Applicant thanks the Examiner for pointing out the typographical error in identification of the assignment in favour of Nortel Networks Limited. An amended statement of the Real Party of Interest is provided as follows.

The real party of interest is Nortel Networks Limited, by virtue of an assignment executed by the inventors in favour of Nortel Networks Corporation recorded on July 8, 1999 at Reel 010090/Frame 0495, and a Universal Change of Name from Nortel Networks Corporation to Nortel Networks Limited recorded on August 30, 2000 at Reel 011195/Frame 0706.

2) **Related Appeals and Interferences**

None.

3) **Status of claims**

Applicant appreciates Examiner's observations concerning labelling of the status of some of the claims. This labelling has been corrected in the listing of claims which appears in the Appendix below. For convenience, Applicant's statement of the status of the claims, which was provided in Application Brief filed August 2, 2004 is repeated below.

Pursuant to the Final Action (paper No. 10) mailed February 4, 2004 and the Advisory Action (paper No. 12) mailed April 12, 2004, the status of the claims is as follows:

(a) claims 1-4 stand rejected under 35 USC § 103(a) as being unpatentable over United States Patent No. 6,047,005 (Sherman et al.);

(b) claims 5,21-24,26, 27 and 28 stand rejected under 35 USC § 103(a) as being unpatentable over United States Patent No. 6,047,005 (Sherman et al.) in view of United States Patent No. 5,263,056 (Urbansky);

(c) claims 6-10 stand rejected under 35 USC § 103(a) as being unpatentable over United States Patent No. 6,047,005 (Sherman et al.) in view of United States Patent No. 5,263,056 (Urbansky), and further in view of United States Patent No. 4,998,242 (Upp);

(d) claim 12 stand rejected under 35 USC § 103(a) as being unpatentable over United States Patent No. 6,047,005 (Sherman et al.) in view of United States Patent No. 6,240,087 (Cummings et al.);

(e) claims 13, 16, 17, 19 and 20 stand rejected under 35 USC § 103(a) as being unpatentable over United States Patent No. 6,047,005 (Sherman et al.) in view of United States Patent No. 4,998,242 (Upp);

(f) claims 14 and 15 stand rejected under 35 USC § 103(a) as being unpatentable over United States Patent No. 6,047,005 (Sherman et al.) in view of United States Patent No. 4,998,242 (Upp), and further in view of United States Patent No. 5,131,013 (Choi);

(g) claim 18 stands rejected under 35 USC § 103(a) as being unpatentable over United States Patent No. 6,047,005 (Sherman et al.) in view of United States Patent No. 4,998,242 (Upp), and further in view of United States Patent No. 5,663,820 (Shiragaki); and

(h) claims 11 and 25 are objected to as being dependent on a rejected base claim.

4) **Status of Amendments**

As noted above, the Applicant's mislabelling of the claim status has been corrected in the listing of claims which appears in the Appendix below. For convenience, Applicant's statement of the status of Amendments, which was provided in Application Brief filed August 2, 2004 is repeated below.

No amendments were submitted in the Applicant's response filed April 5, 2004, to the Final Office Action (paper No. 10) mailed February 4, 2004. Accordingly, the claims remain as amended in the Applicant's response filed on November 3, 2003. A copy of the current claims is provided in the Appendix below.

5) **Summary of Invention**

The present invention is generally directed to methods and systems for transparently transporting data signals having a continuous format through a synchronous transport network.

More particularly, the present invention provides methods and systems for mapping signals of an arbitrary rate into SONET frames, and subsequently de-mapping data from SONET frames to recover the original data signals.

The general concept of mapping a continuous signal into a SONET frame is not new. For example, although United States Patent No. 6,047,005 (Sherman et al.) is not directed to signal mapping per se, Sherman et al discusses the well known technique of mapping T1 signalling into VT1.5 over OC-3 to enable transport of lower rate T1 signalling over a synchronous network. Many signal mappings of this type are well known, and predate the Sherman et al reference. As is well known in the art, these are fixed-rate mappings that involve the insertion of stuff bits (or words) to compensate differences between the known data rate of the customer's data signal and the known line rate of the synchronous transport signal.

As is also well known in the art, and described in the present application, prior art mapping schemes are fixed rate, in that they are designed to map a particular signal type having a known data rate, and are capable of accommodating only very small deviations from that data rate. Thus, as described at page 3, lines 11,-19

> However, the standards or proprietary schemes allow transportation of a very specific set of signals, with format specific hardware. These methods of mapping cannot be used to map rates that vary significantly from the standard. Furthermore, these mappings are each precisely tuned for a particular format and a particular bit-rate, with e.g. a ±20 ppm tolerance. If a signal has, for example, a bit rate even 1% different than that of a DS3, [it] cannot be transported within SONET.

As is also well known in the art, and described in the present application, the prior art mappings must necessarily be provisioned by the network service provider as part of connection set-up. Thus, as each link in an end-to-end connection is established, the network service provider uses detailed information concerning the customer's service requirements to assign network resources (including any necessary mappings) to the link, and these resource allocations remain "nailed-up" for the duration of the connection. Once the connection has been established, the network service provider notifies the customer that the connection is ready for use. If the customer subsequently wishes to change their signal format or data rate, the network service

provider is compelled to "tear down" the connection, and establish an entirely new connection with resource allocations and mappings appropriate for the new signal.

The present invention overcomes this limitation by providing an "adaptive mapping algorithm", which enables the mapping function to be rapidly provisioned "on the fly" (see page 6 line 5). This is accomplished by adaptively mapping the data to the frame, using both fixed stuffs and adaptive stuff bits. The number and location of the adaptive stuff bits are dynamically computed based on the (possibly changing) relationship between the customer's continuous format signal and the fixed length container used for transport across the synchronous network. With this arrangement, changes in the customer's signal format and/or data rate can be accommodated automatically, without intervention by the network service provider to re-provision or alter the connection in any way.

An important aspect of the present invention is that it is capable of mapping to SONET a continuous signal having an arbitrary bit rate. As such, the present invention is not restricted to a single, predetermined bit rate (e.g. 1.544 Megabits per second for a T1 signal), but rather is capable of mapping signals having any bit rate within a broad range, limited primarily by the pull-in range of the clock recovery circuit used to detect the bit rate of the continuous signal. This is emphasized by the text at page 15, lines 7-10, thus:

> "... The data clock **24** (rate R1) is recovered from the incoming data by data recovery unit **36** which comprises a receiver **21** and a flexible clock recovery circuit **25**. Flexible clock recovery circuit **25** is capable of clock recovery over a broad continuous range of bit-rates."

The "broad continuous range of bit-rates" that can be successfully mapped by means of the present invention contrasts markedly with the narrow tolerances (on the order of ±20ppm) of prior art mapping systems.

6) Issues

For convenience, Applicant's statement of the issues, which was provided in Application Brief filed August 2, 2004 is repeated below.

The issues presented for review by the Board of Patent Appeals and Interferences are as follows:

(a) Whether the Examiner has properly given the claims their "broadest reasonable interpretation consistent with the specification" as required by MPEP. § 2111; and

(b) Whether the Applicant has successfully traversed the Examiner's claim rejections under 35 U.S.C. § 103(a).

7) **Grouping of Claims**

Claims 1-28 are pending in the present application. Of these, claims 1, 13, 19 and 21 are independent claims. All of the issues presented for review can be decided with reference to the independent claims.

8) **Claims Appealed**

Applicant appreciates Examiner's observations concerning Applicant's mislabelling of the status of some of the claims. This labelling has been corrected in the listing of claims which appears in the Appendix below.

9) **Prior Art of Record**

The Examiner's statement of the Prior art of Record is correct.

10) **Grounds of Rejection**

The Examiner's statement of the Grounds of Rejections appears to be a true copy of the rejections set forth in the Examiner's Final Action (paper No. 13) mailed February 4, 2004.

11) **Argument**

A. Reply to the Examiner's response to arguments regarding the Examiner's interpretation of the claim limitations.

On page 16 of the Examiner's Answer, the Examiner argues that:

> "Examiner has previously stated that the term 'adaptively' merely means to 'suitably perform some function'. Support for this interpretation can be found in the plain meaning definition given in Merriam Webster's

> Collegiate Dictionary, copyright 1998 ... According to this resource, the term 'adaptively' is a derivative of the term 'adapt' and 'adapt' is defined as 'to make fit' and also has synonyms such as adjust, accommodate, conform, reconcile suit etc. ... In this case, Sherman discloses the process of making a SONET frame suitable for transmitting a T1 signal, thus it is 'adaptively' distributing the T1 bits into a SONET frame."

Furthermore, on page 17 of the Examiner's Answer mailed August 23, 2004, the Examiner states that:

> " ... Sherman conforms the T1 signal for transport in the SONET frame, thus it si 'adapting' the signal for this transportation. ... Since Sherman is using SONET frames to suitably transfer T1 signals across a network, this operation is clearly in line with Examiner's interpretation of the term 'adaptively' ..." (emphasis added)

With respect, Applicant believes that the reference relied upon by the Examiner (Merriam Webster's Collegiate Dictionary, copyright 1998) does not support the Examiner's argument. In particular, the complete definition provided by the Examiner's reference reads "to make fit (as for a specific new use or situation) often by modification". This same reference identifies the words "Adjust", "Accommodate", "Conform" and "Reconcile" as synonyms for "adapt". Notably absent from the list of synonyms is the word "adaptively".

In addition to the references identified by the Examiner, the person of ordinary skill in the art will have access to the www.Thsaurus.com By reference to that site, the person of ordinary skill will discover a extensive list of synonyms for the word "adapt", thus:

> Synonyms: acclimate, accommodate, accustom, alter, change, come around, comply, conform, familiarize, fashion, fit, habituate, harmonize, make, match, modify, prepare, qualify, readjust, reconcile, remodel, revise, shape, shape up, square, suit, tailor

A copy of the relcvant page from www.Thesaurus.com is included in Appendix B. Again, it will be noted that the word "adaptively" is not identified as a synonym for the word "'adapt". Accordingly, the person of ordinary sill in the art, applying the plain meaning of the

terms, would know that the words "adapt" and "adaptive" are not synonyms, and cannot be used interchangeably.

In fact, the word 'adaptively' is explicitly identified in Merriam Webster's Collegiate Dictionary (see the same page provided by the Examiner) as the adverb form of the word 'adaptive'. which is defined as :

"showing or having a capacity for adaptation".

The word 'adaptation' is itself defined as

"1. the act or process of adapting ... 2. adjustment to environmental conditions".

Substituting the definition(s) of the word 'adaptation' into the definition of the word "adaptive' yields the plain meaning of the word 'adaptive',

1. showing or having a capacity for the act or process of adapting

2. showing or having a capacity for adjustment to environmental conditions

Both of these definitions accord with Applicant's stated definition ("the function is performed in such a way that it dynamically adjusts to changes in one or more parameters."), and differ markedly from the meaning of 'adapt'.

In light of the foregoing, Applicant's respectfully submits that "Examiner's interpretation of the term 'adaptively' " is just that. It is the Examiner's own interpretation of the term, which ignores both the well accepted meaning of the term in the art as used in the specification, and the plain language meaning of the term as defined in Merriam Webster's Collegiate Dictionary and numerous other readily available sources.

As such, it is submitted that the Examiner has not given the claims their "broadest reasonable interpretation consistent with the specification" as required by MPEP. § 2111.

B. Reply to the Examiner's response to arguments regarding the 35 U.S.C. § 103(a) rejections of claim 1.

In his arguments bridging pages 16 and 17, the Examiner states that:

> "On page 9, the Appellant argues that the Sherman et al reference is improper because it is not directed toward solving the same problems as the present application. ...

This is incorrect. Applicant is well aware that citability under 35 U.S.C. § 103 is not dependent on a reference being directed to solving the same problems as the claimed invention. In fact, Applicant's arguments on page 9 of the appeal brief are directed to the fact that Sherman et al do not teach, suggest, or even remotely contemplate adaptively mapping a continuous format signal to a container of the synchronous network – and Sherman et al have no need to do so, because they are not trying to solve that problem.

Sherman teaches a system and methods for reducing wasted bandwidth due to under utilization of outbound T1 circuits of a voice response unit (see columns 1 and 2), in which T1 signals are mapped to a SONET frame for transport. Sherman, does not teach any details of the T1 over SONET mapping, and thus the person of ordinary skill in the art must necessarily assume that Sherman et al intend that conventional mapping techniques will be utilized. As such, the system of Sherman is clearly "adapted" (that is, made fit by suitable modification) for performing a conventional T1 over SONET mapping function. However, this mapping function is fully conventional, and thus will include all of the limitations (e.g. specific protocol and data rate) of such prior art mappings. The system of Sherman et al cannot accomplish any other mapping (e.g. mapping into SONET a signal having a different protocol or data rate) without further modification – that is, without being further adapted for that new mapping. The system of Sherman has no capacity for performing such modification itself. As such, the system of Sherman has no "capacity for the act or process of adapting", nor any "capacity for adjustment to environmental conditions". Thus the system of Sherman is not "adaptive", as that term is explicitly defined by the Examiner's reference (Merriam Webster's Collegiate Dictionary, copyright 1998).

Restating this position in terms of the method steps of claim 1, it will be noted that the mapping function utilized by Sherman et al distributes T1 bits into a SONET frame in a manner that is suitable to that purpose. However, it cannot distribute bits of any other protocol or data rate into SONET frames without further modification, and the method of Sherman cannot

perform the necessary adjustments or modifications by itself. As such, the method of Sherman has no "capacity for the act or process of adapting", nor any "capacity for adjustment to environmental conditions". Thus the method of Sherman does not "adaptively" distribute bits of a T1 signal into a SONET frame, as that term is explicitly defined in the Examiner's reference (Merriam Webster's Collegiate Dictionary, copyright 1998).

Sherman et al do not teach or suggest "adaptively distributing the bits of said continuous signal into valid locations of a frame..." as required by claim 1. None or the other cited references provide the missing teaching, for at least the reason that none teach or suggest an "adaptive" mapping function. Thus it is submitted that the applicant has fully traversed the Examiner's rejection of claim 1 and its dependencies under 35 U.S.C. § 103(a).

The same arguments presented above with reference to claim 1 and its dependencies also apply to claims 13, 19 and 21 and their dependencies. Thus, with specific reference to claim 13, Sherman et al do not teach or suggest:

> "a mapping unit for extracting said stream of data bits from said receiver buffer unit at a mapping clock rate, and adaptively inserting stuff bits and said data bits into said frame at a block clock rate according to said control function β."

and with specific reference to claim 19, Sherman et al do not teach or suggest a system having:

> a reverse mapping unit for receiving a frame of said tributary at a block clock rate and a control function β, and extracting a stream of data bits at a mapping clock rate, while excluding stuff bits according to said control function β

and with specific reference to claim 21, Sherman et al do not teach or suggest:

> adaptively mapping said continuous digital signal into said container signal by assigning from a set of assignable locations in said container signal, locations to include adaptive stuff bits, where said set of assignable locations comprises a significant fraction of the locations within said container signal.

None or the other cited references provide the missing teachings, for at least the reason that none teach or suggest methods or systems for adaptively mapping arbitrary rate continuous signals to a synchronous container.

Thus it is submitted that the applicant has fully traversed the Examiner's claim rejections under 35 U.S.C. § 103(a).

12) **Appendix**

Claims involved in the Appeal

1. (previously presented) A method for transmitting a continuous digital signal of an arbitrary rate R1 over a synchronous network, comprising:

selecting a fixed length container signal of a rate R, where R is higher than said arbitrary rate R1 of said continuous signal; and

at a transmit site, adaptively distributing the bits of said continuous signal into valid locations of a frame of said container signal and providing stuff bits into invalid locations,

wherein said invalid locations are uniformly interspersed across said frame.

2. (original) A method as claimed in claim 1, wherein said container signal is a SONET/SDH signal, and said synchronous network is a SONET/SDH network.

3. (previously presented) A method as claimed in claim 2, wherein said continuous digital signal is also a SONET/SDH signal.

4. (original) A method as claimed in claim 2, wherein said SONET/SDH signal comprises a plurality of transparent tributaries.

5. (previously presented) A method as claimed in claim 1, wherein said stuff bits comprises fixed stuff and adaptive stuff bits.

6. (previously presented) A method as claimed in claim 5, wherein said step of adaptively distributing comprises:

determining the phase difference between said continuous digital signal and said container signal;

adaptively adding to the bits of said continuous digital signal including a definite number of locations for accommodating said fixed stuff bits within said frame, and an adjustable number of locations for accommodating said adaptive stuff bits within said frame, based on said phase difference.

7. (previously presented) A method as claimed in claim 6, wherein said adjustable number is significantly larger than said definite number.

8. (previously presented) A method as claimed in claim 6, wherein said definite number includes transport overhead (TOH) locations and remainder fixed stuff bits locations.

9. (previously presented) A method as claimed in claim 8, further comprising providing maintenance, operation, administration and provisioning information in said TOH locations.

10. (previously presented) A method as claimed in claim 6, wherein said step of adaptively adding comprises:

partitioning said frame into a number of equally sized data blocks and said definite number of locations;

for each block,

determining a control function β indicative of said adjustable number; and

mapping said adaptive stuff bits based on said control function.

11. (previously presented) A method as claimed in claim 10, wherein said step of mapping comprises:

providing a counter C for identifying a location in said block;

defining the binary bit reversal α of said control function β;

calculating the bitwise transition delta of said counter C; and

determining if a location identified by said counter C is an invalid location, whenever a function Valid (C,β) is false; and

providing an adaptive stuff bit into said invalid location.

12. (previously presented) A method as claimed in claim 1, further comprising recovering said continuous signal from said synchronous signal at a receive site, by extracting the data bits of said continuous signal from said valid locations of said frame.

13. (previously presented) A synchronizer for adaptively mapping a continuous format signal of an arbitrary rate for transport over a synchronous network, comprising:

a data recovery unit for recovering from said continuous format signal, a stream of data bits and a data clock indicative of said arbitrary rate;

a receiver buffer unit for receiving said stream of data bits, determining a phase difference between said arbitrary rate and the rate of a frame of said tributary, and generating a control function β;

a mapping unit for extracting said stream of data bits from said receiver buffer unit at a mapping clock rate, and adaptively inserting stuff bits and said data bits into said frame at a block clock rate according to said control function β.

14. (previously presented) A synchronizer as claimed in claim 13, wherein said receiver buffer unit comprises:

an elastic store for temporarily storing an amount of data bits of said stream at said data rate clock and providing said data bits to said mapping unit at said block clock rate;

a digital PLL for determining the phase difference between said arbitrary rate and said mapping clock and providing said control function β.

15. (original) A synchronizer as claimed in claim 13, wherein said data recovery unit comprises a frequency agile PLL for detecting said arbitrary rate, and a receiver for detecting said data bits using said data clock.

16. (previously presented) A synchronizer as claimed in claim 13, wherein said mapping unit comprises:

a block clock gapper for receiving a clock indicative of the rate of said synchronous frame and providing said block clock of a block rate accounting for all locations of said synchronous frame and with gaps accounting for a definite number of locations for accommodating fixed stuff bits;

a mapping clock gapper for receiving said block clock and said control signal β and providing a mapping clock of a mapping rate accounting for all locations of said synchronous

frame and with gaps accounting for an adjustable number of locations for accommodating adaptive stuff bits within said frame; and

a mapper for receiving said block clock and said mapping clock and accordingly mapping said stream of data bits in said frame.

17. (currently amended) A synchronizer as claimed in claim 13, further comprising a receiver OH FIFO for arranging a plurality of transport overhead TOH locations for seamless transport of said frame within said synchronous network.

18. (previously presented) A synchronizer as claimed in claim 17, further comprising an overhead multiplexer for adding operation, administration, maintenance and provisioning data into said TOH locations.

19. (previously presented) A de-synchronizer for adaptively reverse mapping a continuous format signal of an arbitrary rate received over a synchronous network as a transparent tributary signal, comprising:

a reverse mapping unit for receiving a frame of said tributary at a block clock rate and a control function β, and extracting a stream of data bits at a mapping clock rate, while excluding stuff bits according to said control function β;

a transmitter buffer unit for receiving said data bits, and determining a phase difference between said arbitrary rate and the rate of said frame; and

a data transmit unit for receiving said data bits and transmitting said continuous format signal at a data rate controlled by said phase difference.

20. (original) A de-synchronizer as claimed in claim 19, wherein said control function β is received in said frame.

21. (previously presented) A method for transmitting a continuous digital signal of a rate R1 over a synchronous network comprising:

selecting a container of a rate R, where R is higher than said rate R1 of said continuous signal; and

adaptively mapping said continuous digital signal into said container signal by assigning from a set of assignable locations in said container signal, locations to include adaptive stuff bits, where said set of assignable locations comprises a significant fraction of the locations within said container signal.

22. (original) A method as claimed in claim 21, where the location and the number of stuff bits assigned depends on the phase of said continuous digital signal.

23. (previously presented) A method as claimed in claim 22, wherein said step of adaptively mapping comprises:

assigning a definite number of locations as fixed stuff bits within a frame of said container signal, and an adjustable number of locations as said locations to include adaptive stuff bits within said frame.

24. (original) A method as claimed in claim 23, wherein said step of adding comprises:

partitioning said frame into a number of equally sized data blocks of said definite number of locations;

for each data block,

determining a control function β indicative of said adjustable number; and

mapping data bits and said adaptive stuff bits within the block based on said control function.

25. (original) A method as claimed in claim 24, wherein said step of mapping comprises:

providing a counter C for identifying a location in said block;

defining the binary reversal α of said control function β;

calculating the bitwise transition delta of said counter C; and

determining if a location identified by said counter C is an invalid location, whenever a function Valid(C, β) is false; and

providing an adaptive stuff bit into said invalid location.

26. (original) A method as claimed in claim 23, further comprising recovering said continuous signal from said synchronous signal at a receive site, by extracting the data bits of said continuous signal from said frame.

27. (original) A method as claimed in claim 24, wherein said phase is communicated to a far end receiver and wherein said far end receiver uses said phase to recover said continuous signal from said synchronous signal by extracting the data bits of said continuous signal from said frame.

28. (original) A method as claimed in claim 21, wherein said continuous signal is a SONET/SDH signal, said container signal is a SONET/SDH signal, and said synchronous network is a SONET/SDH network.

APPENDIX B

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37 entries found for *adapt*.

Entry: adapt
Function: verb
Definition: adjust
Synonyms: acclimate, accommodate, accustom, alter, change, come around, comply, conform, familiarize, fashion, fit, habituate, harmonize, make, match, modify, prepare, qualify, readjust, reconcile, remodel, revise, shape, shape up, square, suit, tailor
Antonyms: disarrange, dislocate, disorder, disturb, unfit
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5) Copyright © 2004 by Lexico Publishing Group, LLC. All rights reserved.*

Entry: acclimate
Function: verb
Definition: adjust
Synonyms: acclimatize, accommodate, accustom, **adapt**, climatize, conform, habituate, harden, season, toughen
Antonyms: confuse, disorder, upset
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5) Copyright © 2004 by Lexico Publishing Group, LLC. All rights reserved.*

Entry: accommodate
Function: verb
Definition: conform
Synonyms: accord, accustom, **adapt**, adjust, agree, attune, comply, compose suit, conform, coordinate, correspond, fit, harmonize, integrate, make consistent, modify, proportion, reconcile, settle, shape up, tailor, tailor-make, tune
Antonyms: constrain
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5) Copyright © 2004 by Lexico Publishing Group, LLC. All rights reserved.*

Entry: acquiesce
Function: verb
Definition: agree
Synonyms: accede, accept, accommodate, **adapt**, adjust, agree, allow, approve, bow to, buy, cave in, come around, comply, concur, conform, consent, give in, give out, go along, okay, play ball, reconcile, set, shake on, submit, subscribe, yes, yield
Antonyms: challenge, disagree, dissent, fight, make a stand, object, protest, rebuff, resist
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5)*

Entry: adjust
Function: verb
Definition: **adapt**
Synonyms: acclimatize, accommodate, accustom, **adapt**, alter, arrange, compose, conform, dispose, doctor, fiddle with, fine tune, fit, fix, fix up, habituate, harmonize, make conform, modify, order, quadrate, reconcile, rectify, redress, regulate, remodel, settle, suit, tailor, tailor-make, tune
Antonyms: confuse, derange, disarrange, disorder, disorganize, upset
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5)*

Entry: adopt
Function: verb
Definition: take on
Synonyms: accept, **adapt**, affiliate, affirm, appropriate, approve, assent, assume, borrow, embrace, endorse, espouse, follow, imitate, maintain, mimic, opt, ratify, seize, select, support, take on, take over, take up, tap, use, utilize
Antonyms: discard, leave alone, pass over, refuse, reject, repudiate, shun
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5)*

Entry: alter
Function: verb
Definition: change
Synonyms: **adapt**, adjust, amend, change, convert, cook, develop, dial back, diversify, doctor, fine tune, make different, metamorphose, mid-course correction, modify, mutate, phony up, recalibrate, recast, reconstruct, refashion, reform, remodel, renovate, reshape, revamp, revise, shift, transform, transmute, turn, vary
Antonyms: continue, keep, let stand, maintain, preserve, retain
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5)*

Entry: arrange

Thesaurus.com/adapt

Function: verb
Definition: plan
Synonyms: **adapt**, adjust, agree to, blueprint, chart, compromise, concert, construct, contrive, decide, design, determine, devise, direct, draft, establish, frame, get ready, harmonize, iron out, lay out, line up, make ready, manage, map out, negotiate, organize, prepare, project, promote, provide, quarterback, resolve, schedule, scheme, set stage, settle, shape up, tailor, work out
Antonyms: disorganize, not plan
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5)*

Entry: arrange
Function: verb
Definition: orchestrate
Synonyms: **adapt**, instrument, orchestrate, score
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5)*

Entry: assimilate
Function: verb
Definition: adjust
Synonyms: acclimatize, accommodate, acculturate, accustom, **adapt**, blend in, conform, fit, go native, homogenize, homologize, intermix, match, mingle, parallel, standardize
Antonyms: maladapt, reject, separate
Source: *Roget's New Millennium™ Thesaurus, First Edition (v 1.0.5)*

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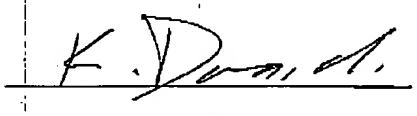
If any extension of time under 37 C.F.R. § 1,136 is required to obtain entry of this brief, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 19-5113.

Respectfully submitted,



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October 25, 2004

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